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Paper 55
Entered: October 15, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

IPA TECHNOLOGIES INC.,
Patent Owner.

IPR2019-00734
Patent 7,036,128 B1

Before KEN B. BARRETT, TREVOR M. JEFFERSON, and BART A. GERSTENBLITH, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background and Summary

Google LLC ("Petitioner")[1] filed a Petition requesting *inter partes* review of U.S. Patent No. 7,036,128 B1 ("the '128 patent," Ex. 1001). Paper 1 ("Pet."). The Petition challenges the patentability of claims 22, 41, 42, 44, and 45 of the '128 patent. We instituted an *inter partes* review of all challenged claims on all proposed grounds of unpatentability. Paper 14, 39. IPA Technologies, Inc. ("Patent Owner")[2] filed a Response to the Petition. Paper 37 ("PO Resp."). Petitioner filed a Reply (Paper 47, "Pet. Reply") and Patent Owner filed a Sur-reply (Paper 51, "PO Sur-reply"). An oral hearing was held on June 4, 2020, and a transcript of the hearing is included in the record. Paper 54 ("Tr.").

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons discussed below, we determine that Petitioner has shown by a preponderance of the evidence that claims 22, 41, 42, 44, and 45 of the '128 patent are unpatentable.

B. Related Proceedings

One or both parties identify, as matters involving or related to the '128 patent, *IPA Technologies Inc. v. Google LLC*, No. 1:18-cv-00318 (D. Del. Feb. 26, 2018); *IPA Technologies Inc. v. Microsoft Corp.*, No. 1:18-cv-00001 (D. Del. Jan. 2, 2018); *IPA Technologies Inc. v. Amazon.com, Inc.*

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[1] Petitioner identifies Google LLC as the real party-in-interest. Pet. 2.
[2] Patent Owner identifies as the real party-in-interest "Patent Owner, IPA Technologies Inc., which is a wholly owned subsidiary of Wi-LAN Technologies Inc. . . . , which is a wholly owned subsidiary of Wi-LAN Inc. . . . , which is a wholly owned subsidiary of Quarterhill Inc." Paper 4, 2; Paper 13, 2.

et al., No. 1:16-cv-01266 (D. Del. Dec. 19, 2016); and Patent Trial and Appeal Board cases *Google LLC v. IPA Technologies Inc.*, IPR2019-00733, IPR2019-00735, and IPR2019-00736, and *Microsoft Corporation v. IPA Technologies Inc.*, IPR2019-00838, IPR2019-00839, and IPR2019-00840. Pet. 2; Paper 4, 2; Paper 13, 2.

C. The '128 Patent

The '128 patent is titled "Using a Community of Distributed Electronic Agents to Support a Highly Mobile, Ambient Computing Environment" and describes "software-based architectures for communication and cooperation among distributed electronic agents to incorporate elements such as GPS or positioning agents and speech recognition into a highly mobile computing environment." Ex. 1001, code (54), 1:23–27. Figure 4 of the '128 patent is reproduced below.

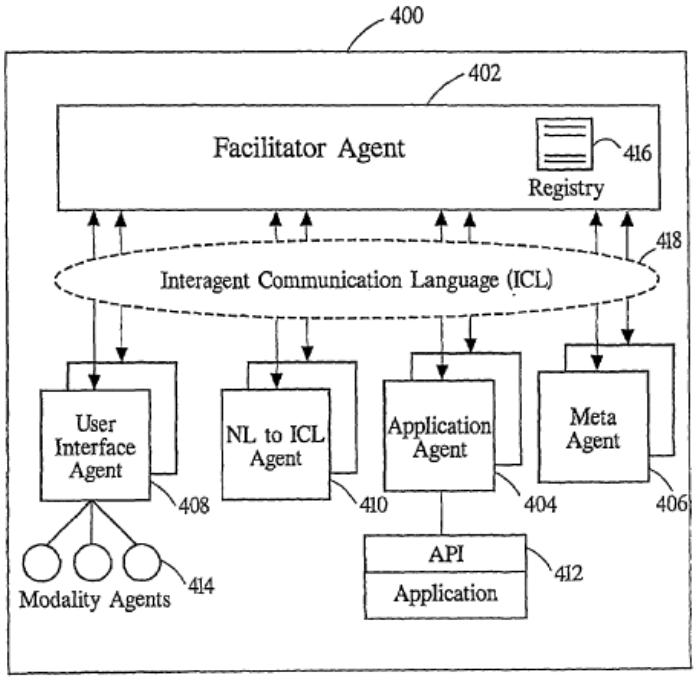

Fig. 4

Figure 4 depicts the structure of an exemplary distributed agent system of the '128 patent. *Id.* at 6:47–52. Figure 4 shows that system 400 includes

facilitator agent 402, user interface agents 408, application agents 404, and meta-agents 406. *Id.* The '128 patent explains that system 400 is organized "as a community of peers by their common relationship" to facilitator agent 402 (*id.* at 6:50–52), which is "a specialized server agent that is responsible for coordinating agent communications and cooperative problem-solving" (*id.* at 6:54–57).

The '128 patent discloses that cooperation among agents is structured around a three-part approach as follows: (1) providers of services register their capabilities specifications with a facilitator; (2) requesters of services construct goals and relay them to a facilitator; and (3) the facilitator coordinates the efforts of the appropriate service providers in satisfying these goals. *Id.* at 10:65–11:6. Such cooperation among agents is achieved via messages expressed in a common language, called the Interagent Communication Language ("ICL"). *Id.* at 10:66–11:1, 7–13.

Referencing Figures 3 and 4, the '128 patent describes a preferred embodiment for the operation of a distributed agent system. *Id.* at 7:34–60. The '128 patent describes that, when invoked, a client agent makes a connection to a facilitator and registers with the facilitator a specification of the capabilities and services it can provide. *Id.* For example, a natural language agent may register the characteristics of its available natural language vocabulary. *Id.* When facilitator agent 402 receives a service request and determines that registered services 416 of one of its client agents will help satisfy a goal of the request, the facilitator sends that client a request expressed in ICL 418. *Id.* at 7:46–55. The client agent parses this request, processes it, and returns answers or status reports to the facilitator. *Id.*

Referencing Figures 5 and 6, the '128 patent describes an exemplary embodiment where user interface agent 408 runs on a user's laptop, accepts user input, sends requests to facilitator agent 402 for delegation to appropriate agents, and displays the results of the distributed computation. *Id.* at 8:7–24. The '128 patent illustrates that, when the question "What is my schedule?" is entered on user interface (UI) 408, UI 408 sends the request to facilitator agent 402, which in turn asks natural language (NL) agent 426 to translate the query into ICL. *Id.* at 8:25–37. The translated ICL expression is then routed by facilitator agent 402 to appropriate agents, e.g., calendar agent 434, to execute the request. *Id.* Finally, results are sent back to UI agent 408 for display. *Id.*

The '128 patent also describes an embodiment directed to mobile users, such as those in a car. *Id.* at 30:23–54. According to the '128 patent, "the present invention enables intelligent collaboration among agents including user interface agents for providing an ambient interface well suited for the mobile environment . . . , as well as location-aware agents providing current positional information through technologies such as Global Positioning System ('GPS')." *Id.* at 30:37–43. The '128 patent explains that "[n]ew technology such as Global Positioning System (GPS), wireless phones, wireless internet, and electronic controls are currently available in cars to improve the way people drive and manage the time spent in automobiles." *Id.* at 30:47–50. The '128 patent states that the disclosed invention "manages this heavy flow of data and keeps the cognitive load as low as possible for the driver" by providing a speech-enabled touchscreen device. *Id.* at 30:50–54.

D. Illustrative Claims

Of the challenged claims of the '128 patent, claims 22, 41, and 45 are independent claims. The remaining challenged claims depend directly from claim 41. Claims 22 and 45, reproduced below with emphasis added and bracketed annotations[3] inserted, are illustrative.

> 22.[pre] A method for providing a mobile, ambient computing environment utilizing a community of distributed electronic agents, the community of agents including one or more user interface agents and *at least one location agent providing information as to a current physical location of a user*, the method comprising the acts of:
>
> [22.a] (a) registering one or more capabilities for each of the electronic agents in an interagent communication language (ICL), wherein the interagent language includes a layer of conversational protocol defined by event types and parameter lists associated with one or more events, and wherein the parameter lists further refine the one or more events;
>
> [22.b] (b) receiving one or more user input requests presented in one or more mobile input types;
>
> [22.c] (c) using the one or more user interface agents to interpret said input request and generate a corresponding goal formulated in ICL;
>
> [22.d] (d) using a facilitator agent to delegate the ICL goal, in the form of one or more ICL sub-goals, to a selected one or more of the electronic agents based upon the registered capabilities of the agents;
>
> [22.e] (e) using the selected electronic agents to perform the delegated ICL sub-goals;
>
> [22.f] (f) in course of said performance by the selected electronic agents, generating one or more new ICL goals for processing by the facilitator agent in accordance with step (d); and
>
> [22.g] (g) iteratively performing the process of steps (d)–(f) until the original ICL goal is satisfied, wherein one or more

[3] We utilize Petitioner's annotations for claim 1 but have retained the paragraph formatting from the issued patent.

of the ICL sub-goals or the new ICL goals requires user location information provided by the location agent.

45.[pre] A computer-implemented highly mobile, ambient computing environment utilizing a community of distributed electronic agents, the computer environment comprising:

[45.a] a plurality of autonomous service-providing electronic agents associated with available resources, wherein one or more capabilities of the service-providing electronic agents are registered in the form of an interagent communication language and [45.b] wherein the interagent language includes a layer of conversational protocol defined by event types and parameter lists associated with one or more events, and [45.c] wherein the parameter lists further refine the one or more events;

[45.d] a facilitator agent arranged to coordinate cooperative task completion utilizing the plurality of autonomous service-providing electronic agents; and

[45.e] a mobile computer interface responsive to a plurality of user input types, the mobile computer interface being in bi-directional communication with the facilitator agent, the mobile computer interface operable to forward a user request for resource access to the facilitator agent for processing, the mobile computer interface further operable to provide the user the requested resource access as provided by the facilitator agent,

[45.f] whereby the mobile user is capable of accessing both local and remote resources.

Ex. 1001, 37:4–35, 38:62–40:8 (emphases added).

E. Evidence

Petitioner relies on the following references:

Reference	**Exhibit No.**
David L. Martin, Adam J. Cheyer, and Douglas B. Moran, *Building Distributed Software Systems with the Open Agent Architecture*, PROCEEDINGS OF THE THIRD INTERNATIONAL CONFERENCE ON THE PRACTICAL APPLICATION OF INTELLIGENT AGENTS AND MULTI-AGENT TECHNOLOGY 355 (1998) ("Martin")[4]	1011
US 5,528,248; filed Aug. 19, 1994; issued June 18, 1996 ("Steiner")	1028

Petitioner also relies on the Declaration of Dr. Dan R. Olsen, Jr. (Ex. 1002) in support of its arguments. The parties rely on other exhibits as discussed below.

[4] Prior to institution, Patent Owner argued that the pertinent portions of the Martin reference (listing as authors Martin, Cheyer, and Moran) and the '128 patent (naming as inventors Julia and Cheyer) are the work of a common inventive entity and therefore cannot be used as prior art. *See, e.g.*, Paper 7 (Prelim. Resp.), 40 (section heading: "*Martin* . . . is Not the Work of Another"); *id.* at 46 ("*Martin* represents the work of joint-inventor Cheyer and should not be considered as a ¶ 102(a) reference."); Paper 11 (Patent Owner's pre-institution sur-reply), 1. Patent Owner does not raise that argument in its Patent Owner Response and has waived the issue. *See* Paper 32, 8 (Scheduling Order; "Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived."); Patent Trial and Appeal Board Consolidated Trial Practice Guide (November 2019) 52 (citing *In re Nuvasive, Inc.*, 842 F.3d 1376, 1381 (Fed. Cir. 2016)).

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
45	103(a)	Martin
22, 41, 42, 44	103(a)	Martin, Steiner

II. ANALYSIS

A. Principles of Law

Petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must establish by a preponderance of the evidence that the challenged claims are unpatentable. 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2019).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) any objective evidence of obviousness or non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (internal quotation marks and citation omitted).

Petitioner's declarant, Dr. Olsen, opines that a person of ordinary skill in the art at the time of the invention of the '128 patent would have had at least a Bachelor's degree in computer science, electrical engineering, or a similar discipline, and one to two years of work experience in networked computer systems or a related area. Ex. 1002 ¶ 14; *see* Pet. 5. Patent Owner does not dispute Dr. Olsen's assessment of the level of ordinary skill in the art. PO Resp. *passim*.

We find Dr. Olsen's definition consistent with the level of ordinary skill in the art reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Therefore, we adopt Dr. Olsen's definition of the level of ordinary skill in the art.

C. Claim Construction

In an *inter partes* review requested in a petition filed on or after November 13, 2018, we apply the same claim construction standard used in district courts, namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340, 51,340, 51,358 (Oct. 11, 2018)

(amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

We determine that no claim terms require express construction in order to resolve the parties' disputes. *See* Pet. 21 ("[T]he Board need not construe any terms of the challenged claims to resolve the underlying controversy, as any reasonable construction reads on the prior art."); Paper 7 ("Prelim. Resp."), 5–6 (Patent Owner stating, under the "Claim Construction" heading, "it is not necessary for the Board to construe any terms to determine whether it should institute review."); PO Resp. i (Patent Owner's table of contents lacking a section heading for "Claim Construction").

D. Asserted Prior Art References

1. Overview of Martin (Ex. 1011)

Martin relates to the Open Agent Architecture (OAA), which "makes it possible for software services to be provided through the cooperative

efforts of distributed collections of autonomous agents." Ex. 1011, 355[5] (Abstr.). According to Martin, "[c]ommunication and cooperation between agents are brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents." *Id.*

Figure 1 of Martin is reproduced below.

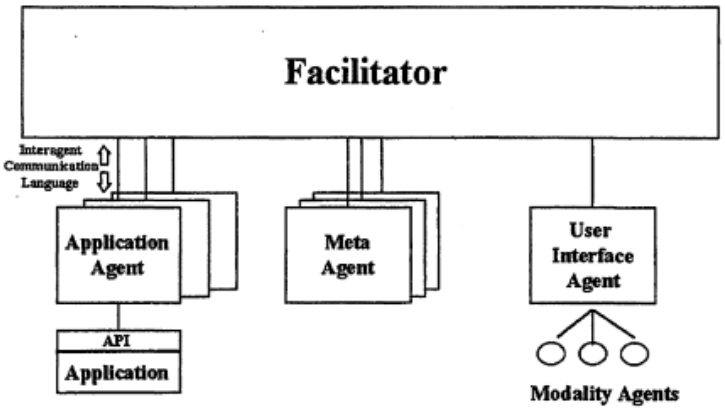

Figure 1: OAA System Structure.

Figure 1 depicts the structure typical of a small OAA system, showing a user interface agent, several application agents, and meta-agents, organized as a community of peers by their common relationship to a facilitator agent. *Id.* at 359. Figure 1 also shows an Interagent Communication Language. *Id.* at 361, Fig. 1.

According to Martin, cooperation among the agents of an OAA system is achieved via messages expressed in a common language, Interagent Communication Language (ICL). *Id.* at 362. Martin describes "Mechanisms of Cooperation" as follows.

> Cooperation among the agents of an OAA system is achieved via messages expressed in a common language, ICL, and is

[5] We, like Petitioner, cite herein to the page numbers in the Martin reference (Exhibit 1011) rather than the page numbers of the exhibit.

> normally structured around a 3-part approach: providers of services register capabilities specifications with a facilitator; requesters of services construct goals and relay them to a facilitator, and facilitators coordinate the efforts of the appropriate service providers in satisfying these goals.

Id.

According to Martin, all agents that are not facilitators are called client agents. *Id.* at 361. Martin describes that when invoked, a client agent makes a connection to a facilitator. *Id.* at 361–62. Upon connection, an agent informs the facilitator of the services it can provide. *Id.* at 362. When the agent is needed, the facilitator sends it a request expressed in ICL. *Id.* The agent parses this request, processes it, and returns answers or status reports to the facilitator. *Id.*

Martin discloses a "Multimodal Map application, in which a user issues commands on a map by drawing, writing and speaking[.]" *Id.* at 359. The Multimodal Map application is described as "Pen/Voice interface to distributed web data." *Id.* at 360 (Table 1, "A partial list of applications written using OAA.").

2. Overview of Steiner (Ex. 1028)

Steiner pertains to the use of a satellite-based location determination system, Global Positioning System (GPS), with a personal digital computing device (PDA). Ex. 1028, 3:16–17, 6:1–6. Steiner describes the disclosed device as follows.

> A Personal Digital Location Apparatus for displaying a geographical location as an icon on a map. The apparatus includes a GPS Smart Antenna for determining the geographical location, a personal computing device including a display, a processing system including a standard software

> operating system . . . , and a map application program capable of running in the operating system.

Id., code (57) (Abstr.).

E. The Alleged Obviousness of Claim 45 Over Martin

Petitioner argues that Martin (Ex. 1011) would have rendered independent claim 45 obvious under 35 U.S.C. § 103. Pet. 22–41; *see* Ex. 1002 ¶¶ 67–96. Petitioner asserts that each limitation of claim 45 is disclosed or suggested by Martin, and, in the alternative, argues that certain limitations would have been obvious. *E.g.*, Pet. 30, 32 ("*Martin* discloses or suggests this limitation [45.c]. . . . To the extent Martin does not explicitly disclose that the parameter lists further refine the one or more events discussed above . . ., it would have been obvious to configure Martin's process to implement this feature."). Patent Owner argues that Petitioner has improperly relied on hindsight, has improperly relied on common sense to supply claim limitations, and has failed to provide adequately supported reasoning as to why one of ordinary skill in the art would have arrived at the claimed invention. PO Resp. 38–43.

1. 45.[pre] A computer-implemented highly mobile, ambient computing environment utilizing a community of distributed electronic agents, the computer environment comprising . . .

Petitioner asserts that the Open Agent Architecture (OAA) "is a computer-implemented, highly mobile, ambient computing environment utilizing a community of distributed electronic agents." Pet. 22 (citing Ex. 1002 ¶ 68; Ex. 1011, Title). Petitioner asserts that, "because *Martin's* community of distributed agents provide services to a user on a personal digital assistant (PDA), which is a mobile computing device, and because various inputs can be detected, *Martin's* community of distributed agents

provides a *highly mobile, ambient* computing environment." *Id.* at 26 (citing Ex. 1002 ¶ 73; Ex. 1011, 374). Patent Owner does not contest these assertions. Regardless of whether this preamble language is limiting, we find, based on the evidence cited by Petitioner, that it is disclosed in the asserted prior art. *Id.* at 22–27.

> 2. *[45.a] a plurality of autonomous service-providing electronic agents associated with available resources, wherein one or more capabilities of the service-providing electronic agents are registered in the form of an interagent communication language and [45.b] wherein the interagent language includes a layer of conversational protocol defined by event types and parameter lists associated with one or more events, and [45.c] wherein the parameter lists further refine the one or more events*

Petitioner argues that Martin discloses that service providers register capability specifications with a facilitator and that every agent participant in an OAA-based system publishes capability declarations in ICL. Pet. 29 (citing Ex. 1011, 355, 362, 27; Ex. 1002 ¶ 79). Quoting the reference, Petitioner notes that "*Martin* states that '[t]he ICL includes a layer of conversational protocol [that] is defined by the event types, together with the parameter lists that are associated with certain of these event types.'" *Id.* at 30 (quoting Ex. 1011, 363) (emphasis omitted, alteration in original).

As to limitation 45.c—"wherein the parameter lists further refine the one or more events"—Petitioner argues that "Martin discloses or suggests this limitation." Pet. 30. Specifically, Petitioner argues that Martin explains that parameter lists refine the semantics of a request for service, which, according to Petitioner, is expressed by an "'event' in the nomenclature of ICL." *Id.* at 30–31 (citing Ex. 1011, 363, 367; Ex. 1002 ¶ 81).

Patent Owner does not contest these assertions. We find, based on the evidence cited by Petitioner, that these limitations 45.a, 45.b, and 45.c are taught or suggested by Martin. *Id.* at 27–32.

Petitioner also reasons that, if Martin does not expressly disclose the feature of limitation 45.c, it would have been obvious in light of Martin's teachings and that which was common knowledge in the art. *Id.* at 32–33 (citing Ex. 1002 ¶¶ 83–84; Ex. 1011, 363; Ex. 1050 (Stroustrup), 153). In light of our findings here, we need not reach this alternative argument.

3. [45.d] a facilitator agent arranged to coordinate cooperative task completion utilizing the plurality of autonomous service-providing electronic agents

Petitioner argues that Martin discloses that a facilitator agent coordinates the efforts of the appropriate service providers to satisfy goals and that Martin also discloses task completions, thereby disclosing a "facilitator agent [that] is arranged to coordinate cooperative task completion using the autonomous service providing electronic agents." Pet. 33–35 (citing Ex. 1002 ¶¶ 85–86; Ex. 1011, 359, 362, 374, Fig. 1). Patent Owner does not contest these assertions. We find, based on the evidence cited by Petitioner, that this limitation 45.d is taught or suggested by Martin. *Id.*

4. [45.e] a mobile computer interface responsive to a plurality of user input types, the mobile computer interface being in bi-directional communication with the facilitator agent, the mobile computer interface operable to forward a user request for resource access to the facilitator agent for processing, the mobile computer interface further operable to provide the user the requested resource access as provided by the facilitator agent,

Petitioner argues that "*Martin* discloses or suggests this limitation." Pet. 35. Petitioner asserts that "*Martin* discloses that the Open Agent Architecture is used to provide '[m]obile interfaces (PDA with telephone) to

[an] integrated community of commercial office applications . . . and AI technologies . . . .'" *Id.* (quoting Ex. 1011, 360 (emphasis omitted; alterations in original)). Petitioner, citing the testimony of Dr. Olsen, asserts that a person of ordinary skill in the art would have understood that a PDA (personal digital assistant) is a type of mobile computer. *Id.* (citing Ex. 1002 ¶ 87). Petitioner explains how Martin discloses a mobile computer interface responsive to various input types, such as speech recognition and drawing, and asserts that a person of ordinary skill in the art would have understood that the interface is available in the applications in addition to the particular Automated Office application discussed explicitly. *Id.* at 36–37 (citing Ex. 1002 ¶ 88).

Petitioner points to, *inter alia*, Martin's Figure 1 as disclosure of the user interface agent that implements the recited mobile computer interface and that is in bi-directional communication with the Facilitator, and persuasively explains, relying on Dr. Olsen's testimony, that a person of ordinary skill in the art would have understood Martin's user interface agent to be operable to perform the recited "forward" and "provide" functions. *Id.* at 37–39 (citing, *inter alia*, Ex. 1011, Fig. 1; Ex. 1002 ¶¶ 89–92).

Patent Owner does not contest these assertions. We find, based on the evidence cited by Petitioner, that this limitation 45.e is taught or suggested by Martin. *Id.* at 35–39.

Petitioner further argues, in the alternative, that,

> [t]o the extent *Martin* does not explicitly disclose that the mobile computer interface is operable to forward a user request *for resource access* to the facilitator agent for processing, and further operable to provide the user *the requested resource access* as provided by the facilitator agent, it would have been

> obvious to configure *Martin*'s mobile computer interface to implement such features.

Id. at 39 (citing Ex. 1002 ¶ 93). Petitioner reasons that, based on Martin's disclosure, the proposed configuration "would have been a mere combination of known components and technologies, according to known methods, to produce predictable results." *Id.* at 39–40 (citing Ex. 1002 ¶ 93; *KSR*, 550 U.S. at 416). In light of our findings here, we need not reach this alternative argument.

5. [45.f] whereby the mobile user is capable of accessing both local and remote resources

Petitioner argues that "*Martin* discloses or suggests this limitation." Pet. 40. Petitioner argues, relying on the testimony of Dr. Olsen, that a person of ordinary skill in the art "would have understood that a user of *Martin*'s 'PDA with telephone' ('the mobile user') is capable of accessing both local and remote resources." *Id.* at 40 (citing Ex. 1002 ¶ 94). Patent Owner does not contest these assertions. We find, based on the evidence cited by Petitioner, that this limitation 45.f is taught or suggested by Martin. *Id.* at 40–41.

Petitioner argues, in the alternative, that it would have been obvious to configure Martin's computing environment to access both local and remote resources based on that which was known in the art. *Id.* at 41 (citing Ex. 1002 ¶ 96). In light of our findings here, we need not reach this alternative argument.

6. Patent Owner's Arguments Regarding Petitioner's Alternative Positions

Patent Owner argues that Petitioner admits that several limitations are not disclosed in Martin and, based on this assertion, further argues that

Petitioner has erroneously relied on common sense to supply those missing limitations. PO Resp. 38–43 (referring to limitations 45.c, 45.e, and 45.f).

We disagree. Petitioner did not admit that the identified limitations are missing from Martin. To the contrary, for each of the identified limitations, Petitioner first set out its position as to how Martin discloses or suggests the limitation, and, in the alternative, argued that it would have been obvious. *E.g.*, Pet. 30, 32 (for limitation 45.c: "*Martin* discloses or suggests this limitation. . . . To the extent *Martin* does not explicitly disclose that the parameter lists further refine the one or more events . . ., it would have been obvious to configure Martin's process to implement this feature."); *see also id.* at 35, 39 (limitation 45.e), 40, 41 (limitation 45.f).

Patent Owner does not dispute Petitioner's primary assertions that the subject limitations are disclosed or suggested by Martin. *See* PO Resp. 38–43. Rather, Patent Owner incorrectly assumed that, "[f]or Ground 1, Petitioner admits *Martin* does not disclose several claim elements," *id.* at 38, and then based its arguments against this ground on this erroneous assumption, *id.* at 39–43. Petitioner replies:

> Far from "admit[ting] [that] Martin does not disclose" claim elements [45.c], [45.e], and [45.f], Google affirmatively demonstrated that each were disclosed by Martin. (Pet. at 30-32 (demonstrating that Martin discloses all of the features of claim element [45.c]), 35-39 (same for claim element [45.e]), 40-41 (same for claim element [45.f]).) IPA does not challenge any of this analysis, rendering its criticisms of Google's obviousness analysis irrelevant.

Pet. Reply 8–9. Patent Owner had the chance to respond in its Sur-reply but chose not to do so. *See* PO Sur-reply ii (Table of Contents lacking a heading for Ground 1); *id.* at 1–2 (summary of the arguments focusing only on Steiner, the secondary reference in Ground 2).

Based on our findings, we do not need to reach Petitioner's alternative positions or, by extension, Patent Owner's arguments as to why those alternative positions allegedly are lacking.

7. Objective Indicia of Non-Obviousness

Patent Owner does not identify specifically any argument as being directed to objective indicia of non-obviousness, but does use the phrase "industry praise." *See* PO Resp. 41. We, out of an abundance of caution, address the assertion as if Patent Owner argues that there exists such objective indicia. Patent Owner argues:

> Here, the limitations in question play an important role in the claims. The OAA framework described in Martin does not represent simple technology. Indeed, as outlined above, *the work on which the '128 Patent is based* was spun off to Siri, Inc. and eventually bought by Apple before that company introduced Siri in 2010. (Ex. 2037, 19:9-17, 25:15-27:5; Ex. 2042; Ex. 2013, ¶¶1-3, 5.).) *Such innovations have garnered industry praise and attention* ushering in a new generation of technology and devices based on many years of work, undercutting any notion that the technology at issue is "simple."

Id. (emphases added); *see also id.* at 1 ("In 2010, Apple released the iPhone 4s, which incorporated the digital assistant Siri, and was lauded as a groundbreaking technological advancement.").

Patent Owner's assertion of "industry praise" lacks any specific tie to the invention of claim 45 (or any other claim) of the '128 patent and is mere attorney argument without citation to any evidence in the record. *See* PO Resp. 41[6] (referring to "[s]uch innovations," which refers back to "the work

[6] The exhibits cited in the block quote (Exhibits 2037, 2042, and 2013) pertain to the employment history of named-inventor Adam Cheyer rather the technology itself.

on which the '128 patent is based"); Pet. Reply 12 ("IPA's call to 'industry praise and attention' (Response at 41) is likewise unsupported by the evidentiary record of these proceedings in a manner linked to limitation [45.e]."). Additionally, to the extent that the purportedly praised "work on which the '128 patent is based" is disclosed in the prior art Martin reference, the value of that praise would be discounted in our analysis. *See* Prelim. Resp. 11 (Patent Owner asserting that "Martin was co-authored by '115 and '128 Patent inventor Adam Cheyer and '115 Patent co-inventor David Martin, along with non-inventor Douglas Moran."); *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1220 (Fed. Cir. 2016) ("The Board properly discounted this and other evidence relating to features that were in the prior art.").

Although Apple may have purchased some "work on which the '128 patent is based," Patent Owner does not assert that Apple purchased the challenged '128 patent itself. PO Resp. 41; *cf.* Ex. 1001, code (73) (identifying SRI International Offices as the assignee on the issued '128 patent). If, as Patent Owner appears to imply, Apple purchased related technology (the purportedly praised "work on which the '128 patent is based") but opted not to acquire the invention of the challenged claim 45, the implication would cut against Patent Owner's position. Regardless, Patent Owner does not direct our attention to any evidence from which to find that any praise for or success of a Siri product is attributable to the subject matter of claim 45.

To the extent that there is any purported evidence of objective indicia (as opposed to mere attorney argument), that evidence is entitled to little or no weight in our obviousness analysis due to the lack of a nexus to the claimed invention. *See Praxair Distribution, Inc. v. Mallinckrodt Hosp.*

Prod. IP Ltd., 890 F.3d 1024, 1036 (Fed. Cir. 2018) (citing *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1220 (Fed. Cir. 2016) ("For objective evidence of secondary considerations to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention." (citations and quotation marks omitted))); *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential) ("Patent Owner does not provide an analysis demonstrating that its products are coextensive (or nearly coextensive) with the challenged claims. We, therefore, find that a presumption of nexus is inappropriate.").

8. Conclusion as to Independent Claim 45

Based on the foregoing, Petitioner has established by a preponderance of the evidence that independent claim 45 is unpatentable over Martin.

F. The Alleged Obviousness of Claims 22, 41, 42, and 44 Over Martin and Steiner

Petitioner argues that independent claims 22 and 41 and claims 42 and 44, both of which depend directly from claim 41, would have been obvious over Martin and Steiner. Pet. 42–70. Petitioner contends that Martin teaches much of the claimed subject matter of independent claims 22 and 41, and turns to Steiner for certain location-related teachings. *See id.* at 42–68. Patent Owner argues that Steiner is not analogous art, that Petitioner's reasoning to combine the references is inadequate, and that Petitioner does not explain how to combine Martin and Steiner. *See, e.g.*, PO Resp. 1–3. Patent Owner does not contest Petitioner's assertions that the combination of Martin and Steiner, if proper, discloses or suggests all of the limitations of each challenged claim. *See, e.g.*, PO Resp. i (Table of Contents identifying only non-analogous art, motivation to combine, and how to combine arguments). For the reasons set forth below, we determine

that Petitioner has demonstrated that claims 22, 41, 42, and 44 would have been obvious over Martin and Steiner.

1. Whether Steiner is Analogous Art

Patent Owner argues that Steiner is non-analogous art and, therefore, cannot be combined with Martin. PO Resp. 1–2; *see id.* at 8.

Two separate tests define the scope of analogous prior art: "(1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved." *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004) (citations omitted).

a. Field of Endeavor

The field of endeavor test "rests on an assessment of the nature of the application and claimed invention in addition to the level of ordinary skill in the art." *In re Bigio*, 381 F.3d at 1326. We "determine the appropriate field of endeavor by reference to explanations of the invention's subject matter in the patent application, including the embodiments, function, and structure of the claimed invention." *Id.* at 1325 (citations omitted).

Patent Owner argues that Steiner is not in the same field of endeavor as the claimed invention. PO Resp. 8–16; PO Sur-reply 3–9. Patent Owner contends that the field of endeavor of the claimed invention is "computer environments and communication among software agents within a distributed computing environment." PO Resp. 11; PO Sur-reply 5. Patent Owner further contends that, in contrast, the field of endeavor of Steiner is "multiple uses of memory cartridges and serial interfaces for Personal Digital Assistants." PO Sur-reply 3 (quoting Ex. 1028, 1:9–10); *see* PO Resp. 10 (quoting Ex. 1028, 1:9–10). Patent Owner asserts that "*Steiner*

discloses the creation of a physical Personal Digital Assistant with specific features, such as built-in memory storage, internal power source, GPS Smart Antenna that receives GPS satellite signals and provides GPS location information." PO Resp. 10 (citing Ex. 1028, 6:1–11); *see also id.* at 15 (Patent Owner characterizing "personal GPS devices" as "the focus of *Steiner*").

Petitioner, on the other hand, contends that the field of endeavor involves a location aspect, specifically arguing that "[t]he '128 patent is directed, among other things, to the incorporation of 'GPS or position agents . . . into a highly mobile computing environment.'" Pet. Reply 2 (quoting Ex. 1001, 1:25–27) (alternation in original). Regarding the reference, Petitioner argues that, "[j]ust like the '128 patent, *Steiner* is also directed to the incorporation of GPS into a mobile computing environment to provide map information." *Id.* at 3.

The '128 patent issued from a continuation-in-part application. Ex. 1001, code (63). According to Patent Owner, the disclosed subject matter in the '128 patent that is new relative to its parent application includes Figures 17–25 and the discussion at column 30, line 7, through column 35, line 17. Prelim. Resp. 38. Patent Owner asserts that "[t]he new '128 Patent material concerns 'Distributed Agents in a Highly Mobile, Ambient Computing Environment,' and specifically discusses the use of GPS, control of navigation systems, control of automobile sound systems, and interface and control of car entertainment centers." *Id.* (citing Ex. 1001, 30:23–32:63). These concepts of mobility, GPS, and navigation are found in the language of, for example, independent claim 22 calling for "at least one location agent providing information as to a current physical location of a

user" and "wherein one or more of the ICL sub-goals or the new ICL goals requires user location information provided by the location agent." Ex. 1001, 37:7–8, 33–35; *see also id.* at 38:36–38, 50–54 (independent claim 41 reciting "using an electronic location agent to ascertain the mobile user's current location; and . . . using one or more interface agents to present navigational information to the user relative to the user's current location"). The preambles of the independent claims tie together the concepts of mobility and of distributed agents in reciting a "mobile, ambient computing environment utilizing a community of distributed electronic agents" (claim 22) and "providing a mobile user with location-sensitive navigational information utilizing a community of distributed electronic agents" (claim 41). *Id.* at 37:4–6, 38:36–38.

The specification of the '128 patent, in the "Field of Invention" section, explains:

> The present invention is related to distributed computing environments and the completion of tasks within such environments. In particular, the present invention teaches a variety of software-based architectures for communication and cooperation among distributed electronic agents to incorporate elements such as GPS or positioning agents and speech recognition into a highly mobile computing environment.

Ex. 1001, 1:20–27. The Specification further describes the combination of distributed agent architecture and location detection for a mobile computing environment. *See, e.g.*, *id.* at 30:6–21 ("In another preferred embodiment of the present invention an application of the collaborative OAA architecture is provided which addresses the post-desktop, mobile/ubiquitous computing environment. The present invention addresses the highly mobile computing environment by incorporating elements such as: GPS agents, . . . by using autonomous service-providing electronic agents associated with available

resources . . . ."); *id.* at 30:37–45 ("In addition, the present invention enables intelligent collaboration among agents including . . . location-aware agents providing current positional information through technologies such as Global Positioning System ('GPS'). Such collaboration yields powerful results greatly enhancing the mobile user's experience . . . .").

Neither party's proposed definition of the '128 patent's field of endeavor is complete, with Patent Owner focusing on a distributed computing environment and Petitioner focusing on location ascertainment. PO Resp. 9–10; Pet. Reply 2–3. The person of ordinary skill in the art would recognize that the field of endeavor includes both components. We determine that the field of endeavor of the '128 patent is, as stated in the Field of Invention, "communication and cooperation among distributed electronic agents to incorporate elements such as GPS or positioning agents and speech recognition into a highly mobile computing environment." Ex. 1001, 1:20–27; *see In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979) (characterizing the "field of the art" statement in the Background of Invention section of the specification as a "more realistic description of the field in which appellants endeavored").

Steiner's "Field of Invention" section states that "[t]his invention relates to multiple uses of memory cartridges and serial interfaces for Personal Digital Assistants." Ex. 1028, 7:7–10. However, this statement, which conspicuously omits any reference to GPS, is not a complete picture of Steiner's field. The title of the Steiner patent is more indicative, stating, "Personal Digital Location Assistant Including a Memory Cartridge, a GPS Smart Antenna and a Personal Computing Device." *Id.*, code (54). In that

same vein, the Abstract offers the following description of the disclosed subject matter:

> A Personal Digital Location Apparatus for displaying a geographical location as an icon on a map. The apparatus includes a GPS Smart Antenna for determining the geographical location, a personal computing device including a display, a processing system including a standard software operating system such as DOS, Windows, Macintosh, or Geoworks, and a map application program capable of running in the operating system.

Id., code (57).

Patent Owner argues that "*Steiner* is not related to . . . communication among software agents within a distributed computing environment, and thus, is in a different field of endeavor than the '128 Patent." PO Resp. 11; *see also* PO Sur-reply at 5. Petitioner, in its field of endeavor argument and consistent with the description in Steiner's abstract, characterizes Steiner as being "directed to the incorporation of GPS into a mobile computing environment to provide map information." Pet. Reply 3. Petitioner, however, does not direct us to any indication that Steiner's endeavor involves a distributed computing environment. *See id.* at 1–5; *cf.* PO Sur-reply 8 (arguing that no form of the term "agent" appears in Steiner and that Steiner's device is not capable of communicating in a distributed computing environment). We determine that Steiner is not in the same field of endeavor as the '128 patent.

Petitioner relies on teachings from another prior art reference, Martin, in arguing that Steiner is in the same field of endeavor as the '128 patent. Pet. Reply 4–5. Petitioner asserts that Martin discloses displaying map information on a mobile device and in a distributed computing environment, and argues that "*Martin* bridges any gap between computer environments

and communication among software agents within a distributed computing environment, and the use of map information with a PDA." *Id.* at 4. In so arguing, Petitioner misplaces reliance on *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1380 (Fed. Cir. 2019). *Id.*; Tr. 38:8–10 ("[Martin] discloses how the Open Agent Architecture can be used with PDAs [not] unlike that in the Steiner reference.").

As *Airbus* states, "the knowledge of a person of ordinary skill in the art, as demonstrated by particular prior art references, could be relevant to establishing the scope of the field of endeavor." *Airbus*, 941 F.3d at 1381. Prior art references other than the subject one can be important "as record evidence relevant to the knowledge and perspective of an ordinarily skilled artisan at the time of the invention." *Id.* Thus, *Airbus* stands for the proposition that other references may be used to better understand the ordinary artisan's perspective as to the field of endeavor. However, in this case, Petitioner is not using Martin to help us understand what Steiner discloses to a person of ordinary skill in the art at the time of the invention. *See* Pet. Reply 4. Rather, Petitioner relies on Martin for material that Steiner does *not* disclose, arguing that Martin fills the gap between the '128 patent and Steiner. *Id.* Petitioner's implied argument that the combination of Martin and Steiner would result in something in the same field of endeavor as the '128 patent is not persuasive in showing that Steiner itself is in the same field of endeavor.

b. Reasonably Pertinent

"A reference is reasonably pertinent [and, thus, analogous art] if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem."

In re Clay, 966 F.2d 656, 659 (Fed. Cir. 1992); *see In re GPAC Inc.*, 57 F.3d 1573, 1578 (Fed. Cir. 1995) (References are analogous art "when a person of ordinary skill would reasonably have consulted those references and applied their teachings in seeking a solution to the problem that the inventor was attempting to solve."). "[T]he purposes of both the invention and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve." *In re Clay*, 966 F.2d at 659. In considering whether a reference is reasonably pertinent, we are directed "to construe the scope of analogous art broadly" because "*familiar items may have obvious uses beyond their primary purposes*, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (quoting *KSR*, 550 U.S. at 402).

Patent Owner contends that the problem addressed by the '128 patent is "develop[ing] distributed systems involving communication and cooperation among software agents." PO Resp. 18 ("*Steiner*'s concern . . . is far afield from the problem addressed by the '128 Patent. There is no indication that a POSA trying to develop distributed systems involving communication and cooperation among software agents (*i.e.*, the '128 Patent), would look to personal handheld devices (*i.e.*, *Steiner*)."); *see also* PO Sur-reply 11 ("[T]he '128 Patent provides for '[c]ommunication and cooperation between agents [] brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents . . . .'" (quoting Ex. 1001, code (57) (Abstract))). Patent Owner argues that "[c]ritically, providing 'map information' or 'GPS to identify location' is not the focus of the

'128 Patent." PO Resp. 19. Thus, Patent Owner argues that the problem addressed in the '128 patent pertains only to distributed systems and software agents. Patent Owner contrasts this with the prior art, contending that the problem addressed by Steiner is "creating an improved Personal Digital Location Assistant device." PO Resp. 17; *see also* Sur-reply 11 (same).

Petitioner, on the other hand, argues that both the '128 patent and Steiner relate to the same problem of "location determination for a map in a mobile device context." Pet. Reply 6.

The challenged '128 patent issued from an application that is a continuation-in-part of the application that issued as U.S. Patent No. 6,851,115 B1 ("the '115 patent"). Ex. 1001, code (63). The '115 patent describes "software-based architectures for communication and cooperation among distributed electronic agents." Ex. 1006, 1:27–29. As Patent Owner admits, the subject matter newly added in the continuation-in-part application "concerns 'Distributed Agents in a Highly Mobile, Ambient Computing Environment,' and specifically discusses the use of GPS, control of navigation systems, control of automobile sound systems, and interface and control of car entertainment centers." Prelim. Resp. 38 (citing Ex. 1001, 30:23–32:63). Thus, the '128 patent builds on its parent and represents an application of the distributed agent system in a mobile computing environment and utilizes a location agent. An example of this is navigation in a moving vehicle, as depicted in Figure 17 of the '128 patent, reproduced below.

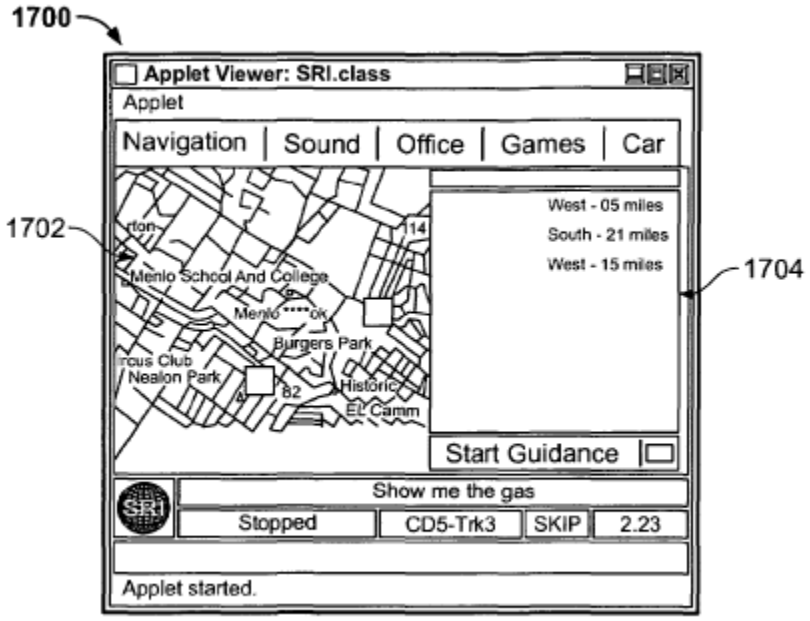

FIG. 17

Figure 17 above "is an illustration showing a navigation panel in accordance with one embodiment of the present invention [of the '128 patent]." Ex. 1001, 6:1–2.

Independent claim 22 of the '128 patent incorporates a location agent into a mobile computing environment of distributed electronic agents, specifically reciting "a mobile, ambient computing environment utilizing a community of distributed electronic agents, the community of agents including . . . at least one location agent providing information as to a current physical location of a user." Ex. 1001, 37:4–8; *see also id.* at 37:33–35 (step (g) utilizing, "user location information provided by the location agent"). Similarly, independent claim 41 recites "providing a mobile user with location-sensitive navigational information utilizing a community of distributed electronic agents." *Id.* at 38:36–38; *see also id.* at 38:50–54 (limitations using the location agent and presenting navigational information via an interface agent). The Specification explains, under the heading

"Distributed Agents in a Highly Mobile, Ambient Computing Environment":

> In another preferred embodiment of the present invention an application of the collaborative OAA architecture is provided which addresses the post-desktop, mobile/ubiquitous computing environment. *The present invention addresses the highly mobile computing environment by incorporating elements such as: GPS agents*, speech recognition (including other hands-free UI, multi-modal UI), and opportunistic connectivity among meeting participants (utilizing docked or IR-linked PDA's in addition to Internet sites), *by using autonomous service-providing electronic agents associated with available resources*, such as meeting resources.

Id. at 30:6–21 (emphases added). The Specification identifies, as examples of the mobile computing environment, a car environment and a portable computing device. *Id.* at 30:25–28. The Specification further explains:

> In addition, the present invention enables intelligent collaboration among agents including user interface agents for providing an ambient interface well suited for the mobile environment as just described, as well as location-aware agents providing current positional information through technologies such as Global Positioning System ("GPS"). Such collaboration yields powerful results greatly enhancing the mobile user's experience, as will now be described and illustrated.

Id. at 30:37–45.

A person of ordinary skill in the art at the time of the invention would have known that a distributed system involving communication and cooperation among software agents was known. *See* Ex. 1011,[7] 355 ("The Open Agent Architecture (OAA), developed and used for several years at

[7] It is appropriate to consider Martin (Ex. 1011) in order to inform our understanding as to how the person of ordinary skill in the art at the time of

SRI International, makes it possible for software services to be provided through the cooperative efforts of distributed collections of autonomous agents. Communication and cooperation between agents are brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents."); Pet. Reply 4–5, 6 (citing Martin (Ex. 1011) in arguing that Steiner is analogous art); *see also* Tr. 37:13–39:3 (Petitioner responding to Patent Owner's Sur-reply). We evaluate whether Steiner is "reasonably pertinent" in light of the knowledge of the person of ordinary skill in the art at the time of the invention and in recognition that the challenged '128 patent, as a continuation-in-part, builds on its parent by implementing a distributed agent system in a mobile environment via the incorporation of location ascertainment. We find it inappropriate in this case to define narrowly the problem addressed by the '128 patent as being focused on only distributed agent systems, as Patent Owner advocates. *See* PO Sur-reply 11–12 (referring to "solv[ing] problems related to developing distributed systems involving communication and cooperation among software agents (*i.e.*, the '128 Patent)."). We find that the problem addressed by the '128 patent includes a location ascertainment aspect.

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the invention would perceive the problem addressed by the challenged patent and by the purportedly analogous art reference. *See Airbus*, 941 F.3d at 1382–83 (holding that the Board erred in failing to consider cited references in addition to the purportedly analogous one and explaining that, "[i]n order to determine whether a reference is 'reasonably pertinent,' then, a reasonable factfinder should consider record evidence cited by the parties to demonstrate the knowledge and perspective of a person of ordinary skill in the art at the time of the invention.").

Steiner explains that then-existing handheld GPS devices (those devices specifically configured for the limited purpose) as well as handheld computers coupled to GPS antennas had shortcomings. Ex. 1028, 5:26–52. Handheld GPS receivers at that time had "limited or no computing power, databases, or map display and [could not] use applications programmed in standard operating systems." *Id.* at 5:26–30. Handheld computers, on the other hand, had computing power for maps and utilized standard operating systems. *Id.* at 5:31–33. A limitation of those systems was that the user could not easily change the location determination application without purchasing duplicate GPS hardware. *Id.* at 5:50–52. Steiner identifies the problem to be addressed:

> What is needed is an handheld apparatus having a GPS antenna and receiver to provide location information, capable of using standard operating systems such as DOS, Windows, Macintosh, or Geoworks to run existing applications, and capable of running programs written in high level languages such as C to provide a mobile professional, a personal traveler, or a navigator with a display of his location and relative locations and the attributes of map features proximate to him.

Id. at 5:53–61.

Steiner is reasonably pertinent to the problem addressed by the '128 patent and would have commended itself to one seeking to solve that problem. Both are concerned with adapting a computing system to a mobile environment by the incorporation of GPS and the like in order to ascertain the user's location on an electronic map. The mobile computing environment of the '128 patent involves distributed electronic agents with one being a location-aware agent, and the mobile computing environment of Steiner is a handheld computer that may be easily reprogrammed with a desired location determination application. The differences between these

computing environments do not, as Patent Owner argues, remove Steiner as a reference that would be considered in addressing the problem of the '128 patent.

Patent Owner raises, in its Sur-reply for the first time, the argument that "there is no evidence of foresight" to support a finding of analogous art and, therefore, only hindsight remains. PO Sur-reply 12–13 (citing *Sci. Plastic Prod., Inc. v. Biotage AB*, 766 F.3d 1355, 1359 (Fed. Cir. 2014) ("The pertinence of the reference as a source of solution to the inventor's problem must be recognizable with the foresight of a person of ordinary skill, not with the hindsight of the inventor's successful achievement.")). Even treating this as a timely argument, we are not persuaded. Patent Owner's assertion fails to acknowledge that the record contains evidence indicating the understanding of the problems in the art through the lens of a person of ordinary skill in the art at the time of the invention, including at least Steiner itself (disclosing the known use of GPS), Martin, the '128 patent (which describes the state of the art and explicitly ties GPS to the named-inventors' endeavor), and Dr. Olsen's testimony (*see, e.g.*, Ex. 1002 ¶¶ 16–60 (discussing that which, "during the time preceding January 1999, a person of ordinary skill in the art would have been aware"), 62–66 (discussing the disclosures of Martin and Steiner), 99 ("Thus, *Steiner* relates to usage of a personal computing device for providing map information, so a person of ordinary skill in the art would have had reason to consider the teachings of *Steiner* when implementing *Martin*'s Open Agent Architecture, which is used for a map application (Multimodal Map) as I discussed above regarding limitation [45.e].")). Patent Owner's late attempt to raise the specter of "hindsight" does not persuade us that a person of

ordinary skill in the art at the time of the invention would fail to recognize, with foresight, the pertinence of Steiner to the '128 patent.

Although Patent Owner does not offer its own definition of the person of ordinary skill in the art, Patent Owner questionably argues that "providing 'map information' or 'GPS to identify location' is not the focus of the '128 Patent," PO Resp. 19, and, based on this, impliedly argues that a person of ordinary skill in the pertinent art would not have been "sufficiently aware of personal GPS devices (the focus of *Steiner*) to even look at such devices," *id.* at 15. Patent Owner makes much of Dr. Olsen's testimony on cross-examination that he had no opinion as to "[h]ow many people knew about [commercial mapping/portable personal mapping devices]." PO Resp. 16 (quoting Ex. 2024, 226:6–24). We do not find to be dispositive the fact that Dr. Olsen, in a 2019 deposition, could not remember the degree of commercialization of GPS in the 1999 timeframe. The better evidence is the contemporaneous reference. Steiner, having an issuance date of 1996, explains that GPS had many applications at that time. *See, e.g.*, Ex. 1028, 4:59–64 ("GPS is used by many professionals engaged in navigation and surveying fields such as marine navigation, aircraft piloting, seismology, boundary surveying, and other applications where accurate location is required or where the cost of GPS is small compared to the cost of a mistake in determining location."); *id.* at 5:1–3 ("GPS is also used for personal travel such as hiking, biking, horseback riding, yachting, fishing, driving in personal cars, and other travel activities."). And notwithstanding Patent Owner's assertion that "GPS to identify location" is not the "focus" of the '128 patent, PO Resp. 19, that patent removes any doubt as to the ordinary artisan's knowledge on the subject in stating:

> New technology such as *Global Positioning System (GPS)*, wireless phones, wireless internet, and electronic controls *are currently available in cars* to improve the way people drive and manage the time spent in automobiles.

Ex. 1001, 30:46–49 (emphasis added). Lastly, as discussed above, the ordinary artisan at the time would have been a computer scientist, an electrical engineer, or similar, *supra*, Section II.B, and we decline to find that such a person would have had no knowledge of GPS as Patent Owner seems to suggest.

Accordingly, for the reasons explained above, we determine that Steiner is analogous art to the '128 patent.

2. The Alleged Obviousness of Independent Claims 22 and 41 in View of Martin and Steiner

As mentioned, Petitioner contends that independent claims 22 and 41, along with dependent claims 42 and 44, would have been obvious over Martin and Steiner. These independent claims are method claims containing several limitations that are somewhat similar to those of apparatus claim 45 (a "computing environment"), which is analyzed above in the context of Petitioner's first ground. As such, Petitioner, in its challenges to claims 22 and 41, references its earlier arguments for corresponding limitations in claim 45, and elaborates as it deems appropriate. *See, e.g.*, Pet. 42 (arguing that Martin discloses distributed agent aspects of the preamble of claim 22 "for at least the same reasons presented above regarding the preamble of claim[] 45. (*Supra* Section IX.A.1.i.).").

Petitioner identifies teachings in the prior art references that disclose or suggest the limitations of these independent claims. Pet. 42–68. Petitioner also supports its contentions for these claims with the testimony of Dr. Olsen. Ex. 1002 ¶¶ 97–140. Patent Owner argues that Petitioner has

failed to adequately explain why and how the references would be combined, but does not dispute Petitioner's assertions that the combination of Martin and Steiner, if proper, discloses or suggests all of the limitations of each challenged claim. *See, e.g.*, PO Resp. i (Table of Contents identifying only arguments concerning non-analogous art, motivation to combine, and how to combine). Thus, the remaining dispositive and disputed issues pertain to Petitioner's reasoning to combine the references' teachings.

Independent claims 22 and 41 each recite a "location agent" that ascertains or provides information regarding a user's location. *See, e.g.*, Ex. 1001, 37:34–35 (claim 22: "user location information provided by the location agent."), 38:50–51 (claim 41: "using an electronic location agent to ascertain the mobile user's current location").

For independent claim 22, Petitioner argues that, "[w]hile *Martin* does not explicitly disclose that the community of agents includes at least one location agent providing information as to a current physical location of a user, it would have been obvious in view of *Steiner* to configure *Martin*'s process to implement such features." Pet. 43 (citing Ex. 1002 ¶ 98). Petitioner maintains that a person of ordinary skill in the art would have been motivated to configure Martin's process, in light of Steiner's teachings, so as to have a location agent providing user location information. *Id.* at 46. In this regard, Petitioner reasons,

> Given that *Martin* discloses an application that uses a PDA (Ex. 1011, 360) (Automated Office is explicitly identified as using a PDA, but a [person of ordinary skill in the art] would have understood this to apply to any of *Martin*'s applications) and *Steiner* discloses determining the location of a PDA . . ., a [person of ordinary skill in the art] would have found it beneficial to ascertain the location of the user of *Martin*'s PDA so that, e.g., such location information could be used for

> providing relevant information to the user via *Martin*'s Multimodal Map application.

Id. (citing Ex. 1011, 15; Ex. 1002 ¶ 102). Thus, Petitioner contends that a person of ordinary skill in the art would have seen value in having Martin's PDA (having a Multimodal Map application) include the user's location. Petitioner's proposed modification is to "configure *Martin*'s process so that the community of agents includes at least one location agent providing information as to a current physical location of a user" and to implement this in Martin's PDA such that a location could be used to provide relevant information to the user via the Multimodal Map application. *Id.* (citing Ex. 1002 ¶ 102). According to Petitioner, the proposed modified configuration "would have been a mere combination of known components and technologies . . . according to known methods, to produce predictable results." *Id.* at 46–47 (citing Ex. 1002 ¶ 103); *see also id.* at 57–58 (addressing the location agent limitation of claim 22).

Petitioner presents similar arguments for independent claim 41. *See id.* at 58–68. For example, Petitioner argues that

> A [person of ordinary skill in the art] would [have] found it predictable and desirable in view of *Steiner* to configure *Martin's* process to implement provide [sic] a mobile user with *location-sensitive navigational* information, e.g., to help the user get to where he/she desires to go based on where he/she currently is located, and to do so with the convenience of a mobile form factor.

Id. at 62 (citing Ex. 1002 ¶ 126); *see also id.* at 66–68 (addressing the location agent limitations of claim 41).

Patent Owner argues that Petitioner has relied on the '128 patent as a roadmap and, therefore, Petitioner has engaged in improper hindsight. PO Resp. 24; PO Sur-reply 13–18. Patent Owner contends that Martin does not

provide a motivation to combine references because it merely discloses the Multimodal Map as an application applying OAA and is not directed to solving problems with or improving navigation and mapping systems. PO Resp. 21–24, 26; PO Sur-reply 15 ("[T]he mapping example in the specification is merely an example of an application (one of many different applications, in fact) that was able to operate with OAA."). This argument is not persuasive because "neither the particular motivation nor the avowed purpose of the patentee controls." *KSR*, 550 U.S. at 419. A person of ordinary skill in the art would not fail to appreciate Martin's teaching of the use of OAA with a mapping application even if that was offered as only one example among many. *See id.* at 421 ("A person of ordinary skill is also a person of ordinary creativity, not an automaton.").

Patent Owner argues that Petitioner has failed to explain "how to combine references." PO Resp. 28 (section heading). Along these lines, Patent Owner first asserts that Petitioner has failed to explain how to reconfigure Martin's applications agents such that one is a location agent. *Id.* at 30. The evidentiary record, however, does not persuade us that creating or modifying application agents was anything other than routine to one of ordinary skill in the art at the time of the invention. *See id.* at 30–34 (presenting, almost exclusively, attorney argument with discussions of other cases rather than addressing the matter as a factual issue based on the evidence in this case). In contrast, Dr. Olsen presents credible and unrebutted testimony that the proposed combination involves known methods and would have been straightforward to implement and would have produced predictable results. Ex. 1002 ¶ 103; *see id.* ("[A] person of ordinary skill in the art, who was skilled in programming software, would

have known how to implement the application agents to provide various types of services, including providing information as to a current physical location of the user."). Consistent with that, Martin indicates that the level of skill of the ordinary artisan at the time was high and that one was familiar with electronic agents, and Martin even teaches the utilization of a mapping application in the OAA context. *See, e.g.*, Ex. 1011, 359–61. We find that a person of ordinary skill in the art would have known how to configure Martin's agents as proposed by Petitioner and would have been able to do so, and that the combination would have yielded predictable results.

Patent Owner next argues that Petitioner's proposed combination yields an inoperable system. PO Resp. 34–38. Patent Owner's argument is best summarized in its Sur-reply, where it asserts that "*Steiner's* Personal Digital Location Assistant device is a stand-alone device which was not designed to exchange location information with other devices" and, "[a]s such, Steiner cannot serve as an agent within a distributed system (i.e., *Martin*), which is necessary for [Petitioner] Google's obviousness argument to prevail." PO Sur-reply 19–20; *see also id.* at 1 (arguing that the combination "is not operable because *Steiner* is a self-contained device incapable of sharing information with other devices which is a prerequisite for combining *Steiner* with *Martin*'s distributed agent system"); PO Resp. 36– 40 (arguing that Steiner's "location information is provided only internally . . . [within] Steiner's standalone device" and "[t]he Steiner device has no means of sending location information to other devices" (emphasis omitted)). Patent Owner's argument is not persuasive as it is based on a mischaracterization of Petitioner's proposed combination and a misapplication of the law. Petitioner is not, as Patent Owner implies, bodily

incorporating Steiner's *device*—a handheld GPS unit—into Martin's network. Rather, Petitioner proposes to combine the references' *teachings* (not two physical devices), specifically applying Steiner's location ascertainment teachings by having one of Martin's agents be a location agent. *E.g.*, Pet. 46 (claim 22), 60, 62–63 (claim 41); *see In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference . . . . Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art."). Petitioner has presented adequate and persuasive evidence that a person of ordinary skill in the art at the time of the invention would have been able to make this modification, and we find that the proposed combination results in an operable system. *See, e.g.*, Pet. 46–47, 61–63; Ex. 1002 ¶¶ 102–103, 126–128.

Having considered all of the parties' arguments and evidence, we determine that Petitioner sufficiently shows that the combination of Martin and Steiner teaches the limitations of independent claims 22 and 41, that Petitioner has provided adequate reasoning as to why one of ordinary skill in the art would have modified Martin's distributed agent system by incorporating location ascertainment in accordance with Steiner's teachings and that this combination yields the subject matter of those claims, and that Petitioner has provided adequate evidence to show that a person of ordinary skill in the art would have had a reasonable expectation of success in doing so.

Based on the foregoing, Petitioner has established by a preponderance of the evidence that independent claims 22 and 41 are unpatentable over the combination of Martin and Steiner.

3. The Alleged Obviousness of Dependent Claims 42 and 44 in View of Martin and Steiner

Petitioner also argues that claims 42 and 44, which depend directly from claim 41, would have been obvious over the combination of Martin and Steiner. Pet. 68–70 (citing Ex. 1002 ¶¶ 141–143). Petitioner identifies teachings in the prior art references that teach or suggest the limitations of these dependent claims, and provides persuasive reasoning as to why the claimed subject matter would have been obvious to one of ordinary skill in the art. *Id.* Petitioner also supports its contentions for these claims with the testimony of Dr. Olsen. Ex. 1002 ¶¶ 141–143. Patent Owner does not present any arguments for these dependent claims other than what we have considered already with respect to independent claim 41. *See, e.g.*, PO Resp. 21 (presenting, for all the claims challenged in Ground 2, the argument that Petitioner's motivation to combine is flawed).

We have considered the evidence and arguments of record and determine that Petitioner has demonstrated by a preponderance of the evidence that claims 42 and 44 would have been obvious based on Martin and Steiner for the reasons discussed in the Petition as supported by the testimony of Dr. Olsen.

G. Patent Owner's Takings and Appointments Clause Arguments

Patent Owner argues that "subjecting a patent effectively filed before September 16, 2012 (when the relevant provisions of the Leahy-Smith America Invents Act went into effect) to *inter partes* review is an impermissibly retroactive, unconstitutional taking" and "violates the Due

Process Clause of the Fifth Amendment by eviscerating the Patent Owner's substantive vested rights." PO Resp. 43–44; *see* PO Sur-reply 21. We decline to consider Patent Owner's constitutional challenge as the Federal Circuit addressed this issue in *Celgene Corp. v. Peter*, 931 F.3d 1342, 1362–63 (Fed. Cir. 2019).

Patent Owner also argues that "*inter partes* review violates the Appointments Clause of the U.S. Constitution" and "notwithstanding the Federal Circuit's recent opinion in *Arthrex*, the 'statutory limitations on the removal of [Administrative Patent Judges]' under Title 5 are not severable by the Federal Circuit." PO Resp. 44 (citing *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320, 1338 (Fed. Cir. 2019), *cert. granted sub nom. United States v. Arthrex, Inc.*, 2020 WL 6037206 (Oct. 13, 2020)). We decline to consider Patent Owner's Appointments Clause challenge as the Federal Circuit addressed this issue in *Arthrex*, 941 F.3d at 1325, 1337–38.

III. CONCLUSION[8]

Petitioner has shown by a preponderance of the evidence that claims 22, 41, 42, 44, and 45 of the '128 patent would have been obvious.

[8] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

IV. ORDER

For the foregoing reasons, it is

ORDERED that claims 22, 41, 42, 44, and 45 of the '128 patent have been proven to be unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

In summary:

Claims	**35 U.S.C. §**	**Reference(s)/Basis**	**Claims Shown Unpatentable**	**Claims Not shown Unpatentable**
45	103(a)	Martin	45	
22, 41, 42, 44	103(a)	Martin, Steiner	22, 41, 42, 44	
Overall Outcome			22, 41, 42, 44, 45	

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